Kindly cancel claims 1-65, and add new claims 66-155 as follows prior to continuing with examination of this case:

66. (New) A spectral imaging system for generating and analyzing spectral images of a wafer having one or more film layers, the system including:

an optical assembly for collecting light reflected from a portion of the wafer;

a slit that receives light focused by said optical assembly and used to restrict light from within said portion of the wafer to a one-dimensional line within said portion;

a concave mirror disposed to receive light from said slit and to reflect the light towards a convex mirror that reflects the light back to said concave mirror whereupon it undergoes a second reflection;

a diffractive element to disperse light received from said second reflection from said concave mirror, the light being from said one-dimensional line within said portion of the wafer, where the dispersion of light from said one-dimensional line is in a spectral direction perpendicular to said one-dimensional line;

a camera with a two-dimensional detector to detect the dispersed light to form one-spatial dimension, one-spectral dimension frames of reflectance data; and

a processor for aggregating said frames to form a two-dimensional spectral image of said portion of the wafer and for analyzing said two-dimensional spectral image to determine a film layer property or a plurality of film layer properties of said one or more film layers.

67. (New) The system of claim 66 where the film property is a thickness value of one of one of the one or more film layers at one or more sites on the wafer.

68. (New) The system of claim 66 where said processor determines a process endpoint.

69. (New) A method of creating and analyzing spectral images of a wafer having one or more film layers including the steps of:

collecting light reflected from a portion of the wafer using an optical assembly to focus said light onto a slit;

restricting the light from within said portion of the wafer to a one-dimensional line within said portion using said slit;

reflecting from a concave mirror the light from said portion, where said concave mirror is disposed to receive light from said slit and to reflect the light towards a convex mirror that reflects the light back to said concave mirror whereupon it undergoes a second reflection;

diffracting the light passing through said slit using a diffraction grating, the light being from said one-dimensional line within said portion of the wafer, where said diffraction grating creates diffracted light from said one-dimensional line in a spectral direction perpendicular to said slit;

detecting the diffracted light using a camera with a two-dimensional detector, said diffracted light forming a one-spatial dimension, one-spectral dimension frame of reflectance data; and

collecting a sequence of spectral frames using said camera

using a processor to aggregate said frames to form a two-dimensional spectral image of said portion of the wafer and analyzing said two-dimensional spectral image to determine a film layer property or a plurality of film layer properties of the one or more film layers.

70. (New) The method of claim 69 where the film layer property is a thickness value of one of the one or more film layers at one or more sites on the wafer.

71. (New) The method of claim 69 where analyzing determines a process endpoint.

72. (New) A method of forming and analyzing a spectral image of a wafer having one or more film layers including the steps of:

collecting light using an optical assembly, where the light is from a light source and is reflected from a portion of the wafer, and then focused onto a slit;

restricting the light from within said portion of the wafer to a one-dimensional line within said portion using said slit;

reflecting from a concave mirror the light from said portion, where said concave mirror is disposed to receive light from said slit and to reflect the light towards a convex mirror that reflects the light back to said concave mirror whereupon it undergoes a second reflection;

diffracting the light passing through said slit using a diffractive element, the light being from said one-dimensional line within said portion of the wafer, where said diffractive element creates diffracted light from said one-dimensional line in a spectral direction perpendicular to said slit;

detecting the diffracted light using a camera with a two-dimensional detector, said diffracted light forming a one-spatial dimension, one-spectral dimension frame of reflectance data;

collecting a sequence of spatially contiguous spectral frames using said camera; and

using a processor to aggregate said frames to form a two-dimensional spectral image of said portion of the wafer and to analyzing said two-dimensional spectral image to determine a film layer property or a plurality of film layer properties of said one or more film layers.

73. (New) The method of claim 72 where the film layer property is a thickness value of one of the one or more film layers at one or more sites on the wafer.

74. (New) The method of claim 72 where analyzing determines a process endpoint.

75. (New) A system for obtaining and analyzing spectral images of a wafer having one or more film layers, the system comprising:

means for transferring the wafer;

means for illuminating the wafer;

a plurality of spectral imagers disposed to detect light reflected from the wafer, where each of said plurality of spectral imagers has a long axis, and said plurality of spectral imagers is arranged along a common axis collinear with said long axes, while the wafer and said plurality of spectral imagers undergo relative motion to produce a plurality of one-dimensional spectral frames; and

means for aggregating said plurality of one-dimensional spectral frames from said plurality of spectral imagers to form a two-dimensional spectral image and to analyze said two-dimensional spectral image to determine a film layer property or a plurality of film layer properties of said one or more film layers.

76. (New) The system of claim 75 where the film property is a thickness value of one of one of the one or more film layers at one or more sites on the wafer.

77. (New) The system of claim 75 where said processor determines a process endpoint.

78. (New) A method of obtaining and analyzing spectral images of a wafer having one or more film layers, the method comprising the steps of:

transferring the wafer using a transfer mechanism;

illuminating the wafer using a light source;

using a plurality of spectral imagers to detect light reflected from the wafer to collect a plurality of one-dimensional spectral frames, where each of said plurality of spectral imagers has a long axis, and said plurality of spectral imagers is arranged along a common axis collinear with said long axes, while the wafer and said plurality of spectral imagers undergo relative motion to produce; and

using a processor to aggregate said plurality of one-dimensional spectral frames from said plurality of spectral imagers to form a two-dimensional spectral image, and for analyzing said two-dimensional spectral image to determine a film layer property or a plurality of film layer properties of said one or more film layers.

79. (New) The method of claim 78 where the film layer property is a thickness value of one of the one or more film layers at one or more sites on the wafer.

80. (New) The method of claim 78 where analyzing determines a process endpoint.

81. (New) A system for obtaining spectral images of a wafer having one or more film layers, the system comprising:

means for transferring the wafer;

means for illuminating the wafer;

a plurality of spectral imagers disposed to detect light reflected from the wafer, where each of said plurality of spectral imagers images a different portion of the wafer, while the wafer and said plurality of spectral imagers undergo relative motion to produce a plurality of one-dimensional spectral frames; and

means for aggregating said plurality of one-dimensional spectral frames from said plurality of spectral imagers to form a two-dimensional spectral image and for analyzing said two-dimensional spectral image to determine a film layer property or a plurality of film layer properties of said one or more film layers.

82. (New) The system of claim 81 where the film property is a thickness value of one of one of the one or more film layers at one or more sites on the wafer.

83. (New) The system of claim 81 where said processor determines a process endpoint.

84. (New) A method of obtaining spectral images of a wafer having one or more film layers, the method comprising the steps of:

transferring the wafer using a transfer mechanism;

illuminating the wafer using a light source;

using a plurality of spectral imagers disposed to detect light reflected from the wafer to collect a plurality of one-dimensional spectral frames of a different portion of the wafer, while the wafer and said plurality of spectral imagers undergo relative motion to produce; and

aggregating with a processor said plurality of one-dimensional spectral frames from said plurality of spectral imagers to form a two-dimensional spectral image, and analyzing said two-dimensional spectral image with said processor to determine a film layer property or a plurality of film layer properties of said one or more film layers.

85. (New) The method of claim 84 where the film layer property is a thickness value of one of the one or more film layers at one or more sites on the wafer.

86. (New) The method of claim 84 where analyzing determines a process endpoint.

87. (New) A method of determining a process time of a semiconductor manufacturing process from spectral images of a portion of a wafer having one or more film layers and a one or more measurement sites that includes the steps of :

performing a manufacturing process on the wafer using a manufacturing process tool;

illuminating a portion of the wafer that includes the measurement site with light while translating the wafer with a translation mechanism;

obtaining a plurality of one-dimensional images of said portion using a spectral imager disposed within said process tool and configured to collect light reflected from said portion;

using a processor configured to aggregate said one-dimensional images to form a two-dimensional spectral image, and to identify a measurement site image within said two-dimensional spectral image that corresponds to the measurement site;

determining a film layer property or a plurality of film layer properties of the one or more film layers at said one or more measurement sites; and

determining a process parameter for a subsequently processed wafer subject to said manufacturing process step based on a criteria that depends on said film property value.

88. (New) The method of claim 87 where the film layer property is a thickness value of one of the one or more film layers at one or more sites on the wafer.

89. (New) The method of claim 87 where said criteria is a reference thickness value.

90. (New) A method of orienting a two-dimensional spectral image of a wafer having a notch that includes the steps of:

identifying a wafer image edge within the spectral image;

detecting a notch image along said wafer image edge;

identifying a wafer image orientation based on said notch image; and

translating the wafer image to align said notch image in a preferred direction.

91. (New) A method of identifying a measurement site location in a two-dimensional spectral image of a wafer having a notch and a plurality of die having die dimensions that includes the steps of:

identifying a wafer image edge within the two-dimensional spectral image;

detecting a notch image along said wafer image edge;

identifying a wafer image orientation based on said notch image;

identifying a street orientation within the two-dimensional spectral image; and

identifying the measurement site within the two-dimensional spectral image based on said wafer image orientation, said street orientation, and the die dimensions.

92. (New) A method of orienting an image of a wafer having a notch that includes the steps of:

(a) acquiring a two-dimensional spectral image of the wafer, where the wafer has a nominal wafer center, and where said two-dimensional spectral image has a plurality of rows and columns corresponding to spatial locations with each column having a first end and a second end and each row having a first end and a second end, and spectra corresponding to each spatial location, and where said two-dimensional spectral image has a spatial resolution of 50 microns or less;

(b) determining a first edge location in each of said plurality of columns of spatial locations by comparing reflectance values to a threshold value at successive points starting from said first end;

(c) calculating a radial distance from said first edge location to said nominal wafer center, and an angle formed by said first edge location to said nominal wafer center and a reference point;

(d) repeating steps (b) through (c) for all columns to form an edge distance curve;

(e) determining a second edge location in each of said plurality of columns of spatial locations by comparing reflectance values to said threshold value at successive points starting from said second end;

(f) calculating a second radial distance from said second edge location to said nominal wafer center, and a second angle formed by said second edge location to said nominal wafer center and the reference point;

(g) repeating steps (e) through (f) for all columns and appending said second radial distances and said second angles to said edge distance curve;

(h) differentiating said edge distance curve to form a differentiated edge distance curve;

(i) identifying a nominal notch location from a peak in said differentiated edge distance curve;

(j) identifying an exact notch location by curve fitting points in said differentiated distance curve near said peak to find an exact peak location; and

(k) rotating said two-dimensional spectral image of the wafer by an angle determined by said exact notch location.

93. (New) A method of forming a two-dimensional map of a film property of a portion of a patterned semiconductor wafer having one or more film layers, the method including the steps of:

acquiring a plurality of one-dimensional spectral images having a first spatial dimension and a spectral dimension along a second spatial dimension;

forming a two-dimensional spectral image by aggregating said plurality of one-dimensional spectral images along said second spatial dimension, where said two-dimensional spectral image has a spatial resolution of 50 microns or less;

determining the property value of the one or more film layers for each of a plurality of points of said two-dimensional spectral image; and

aggregating said values to form a two-dimensional map of the property values of the portion of the patterned semiconductor wafer.

94. (New) The method of claim 93 where the property value is a film layer thickness.

95. (New) The method of claim 93 where the portion includes the patterned semiconductor wafer in its entirety.

96. (New) The method of claim 93 where the portion includes less than the patterned semiconductor wafer in its entirety.

97. (New) A method of determining a film layer property value or a plurality of film layer property values from spectral images of a wafer having one or more film layers and one or more measurement sites, the method including the steps of:

acquiring a two-dimensional spectral image having a spatial resolution of 50 microns or less;

accessing coordinate locations of the one or more measurement sites on the wafer;

determining a one or more spectral image locations within said two-dimensional spectral image corresponding to said one or more measurement sites; and

calculating the film layer property value or the plurality of film layer property values of the one or more films at said one or more spectral image locations.

98. (New) The method of claim 97 where the film layer property is a thickness value of one of the one or more film layers at one or more sites on the wafer.

99. (New) The method of claim 97 where calculating determines a process endpoint.

100. (New) A method of analyzing spectral images of a wafer having one or more film layers and one or more measurement sites, the method including the steps of:

aggregating a plurality of one-dimensional spectral images having a having a spatial resolution of 50 microns or less to form a two-dimensional spectral image;

accessing coordinate locations of the one or more measurement sites on the wafer;

determining a spectral image neighborhood corresponding to each of said one or more measurement sites, where said spectral image neighborhood has a plurality of spatial locations;

determining a fit value by comparing a modeled intensity value with a measured intensity value at each of said plurality of spatial locations within said spectral image neighborhood corresponding to each of said one or more measurement sites;

optimizing said fit value to determine a best fit value within said image neighborhood corresponding to each of said one or more measurement sites;

identifying a property value of the one or more films to said best fit value within said image neighborhood corresponding to each of said one or more measurement sites.

101. (New) The method of claim 100 where the film layer property is a thickness value of one of the one or more film layers at one or more sites on the wafer.

102. (New) The method of claim 100 where analyzing determines a process endpoint.

103. (New) A CVD system that acquires and analyzes spectral images of a wafer having one or more film properties prior to, during, and/or following a CVD process, the system comprising:

a plurality of stations involved in performing one or more aspects of the CVD process;

a wafer transfer mechanism disposed within the system to transfer the wafer between stations;

means for illuminating the wafer while the wafer is transferred between stations;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

a processing means for analyzing said plurality of one-dimensional spectral frames, where said processing means aggregates sequential one-dimensional spectral frames to form two-dimensional spectral images and analyzes them.

104. (New) The system of claim 103 where the one or more film properties is a thickness value of one of one of the one or more film layers at one or more sites on the wafer.

105. (New) The system of claim 103 where said processing means determines a process endpoint.

106. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a CVD process, the method comprising the steps of:

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a sequence of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by a transfer mechanism used to move wafers between one or more storage and one or more process stations;

aggregating said sequence of one-dimensional spectral frames to form a two-dimensional spectral image, and analyzing said two-dimensional image to determine a film layer property.

107. (New) The method of claim 106 where the film layer property is a thickness value of one of the one or more film layers at one or more sites on the wafer.

108. (New) The method of claim 106 where analyzing determines a process endpoint.

109. (New) A CMP system that acquires and analyzes spectral images of a wafer having one or more film properties prior to, during, and/or following a CMP process, the system comprising:

a plurality of stations involved in performing one or more aspects of the CMP process;

a wafer transfer mechanism disposed within the system to transfer the wafer between said stations;

means for illuminating the wafer while the wafer is transferred between stations;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

means for processing said plurality of one-dimensional spectral frames, where said processing means aggregates sequential one-dimensional spectral frames to form a two-dimensional spectral image, and analyzes said two-dimensional spectral image to determine one or more film layer properties.

110. (New) The system of claim 109 where the one or more film layer properties is a thickness value of one of the one or more film layers at one or more sites on the wafer.

111. (New) The system of claim 109 where said processing means determines a process endpoint.

112. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a CMP process, the method comprising the steps of:

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a sequence of spatially contiguous one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by a transfer mechanism used to move wafers between one or more storage and one or more process stations;

aggregating said frames to form a two-dimensional spectral image; and

analyzing said two-dimensional spectral image.

113. (New) The method of claim 112 where analyzing said two-dimensional spectral image determines a film layer thickness value of one of the one or more films at one or more sites on the wafer.

114. (New) The method of claim 112 where analyzing said two-dimensional spectral image determines a process endpoint.

115. (New) A semiconductor wafer processing system that acquires and analyzes spectral images of a wafer prior to, during, and/or following a process, the system comprising:

a plurality of stations involved in performing one or more aspects of the system process;

a wafer transfer mechanism disposed within the system to transfer the wafer between stations;

means for illuminating the wafer while the wafer is transferred between said stations;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer, and where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

a processing means for analyzing said plurality of one-dimensional spectral frames, where said processing means aggregates sequential one-dimensional spectral frames to form two-dimensional spectral images.

116. (New) The system of claim 115 where the one or more film layer properties is a thickness value of one of the one or more film layers at one or more sites on the wafer.

117. (New) The system of claim 115 where said processing means determines a process endpoint.

118. (New) The system of claim 115 where the process is one of: a CVD process, a CMP process, or a stand-alone metrology process.

119. (New) The system of claim 115 where stations include one of: a load station, an unload station, or a process station.

120. (New) The system of claim 115 where said illuminating means is either pulsed or continuous while said spectral imager detects light.

121. (New) A method of acquiring and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a wafer manufacturing process, the method comprising the steps of:

securing the wafer in a transfer mechanism;

illuminating the wafer with light from a light source;

positioning the wafer using said transfer mechanism so that light from said light source illuminates a desired portion of the wafer;

detecting light from said light source that is reflected from said desired portion of the wafer using a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer, and where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion provided by said wafer transfer mechanism; and

analyzing said plurality of one-dimensional spectral frames with a means for processing, where said processing means aggregates sequential one-dimensional spectral frames to form two-

dimensional spectral images, and analyzes said two-dimensional spectral images to determine a one or more film properties of the one or more film layers.

122. (New) The method of claim 121 where analyzing said two-dimensional spectral image determines a film layer thickness value of one of the one or more films at one or more sites on the wafer.

123. (New) The method of claim 121 where analyzing said two-dimensional spectral image determines a process endpoint.

124. (New) The method of claim 121 where said light source operates in either in a continuous mode, or in a pulsed mode while said spectral imager detects light.

125. (New) A semiconductor wafer processing system that provides and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a process, the system comprising:

a wafer transfer mechanism disposed within the system to transfer the wafer between a load station and a wafer chuck;

means for illuminating the wafer while the wafer is transferred between said load station and said wafer chuck;

a spectral imager disposed to detect light reflected from the wafer and configured to produce a one-dimensional spectral frame while said spectral imager and the wafer undergo relative motion; and

a processor that analyzes said one-dimensional frame.

126. (New) The system of claim 125 where the one or more film layer properties is a thickness value of one of the one or more film layers at one or more sites on the wafer.

127. (New) The system of claim 125 where said processor determines a process endpoint.

128. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a wafer manufacturing process, the method comprising the steps of:

securing the wafer in a transfer mechanism;

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated using said transfer mechanism;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a one-dimensional spectral frame; and

analyzing said one-dimensional spectral frame to determine a film property of the one or more films.

129. (New) The method of claim 128 where analyzing said one-dimensional spectral image determines a film layer thickness value of one of the one or more films at one or more sites on the wafer.

130. (New) The method of claim 128 where analyzing said one-dimensional spectral image determines a process endpoint.

131. (New) A semiconductor wafer imaging system that acquires and analyzes spectral images of a wafer having one or more film layers prior to and/or following a process, the system comprising:

a first processing system that performs a first manufacturing step on the wafer;

a second processing system that performs a second manufacturing step on the wafer, where said second manufacturing step follows said first manufacturing step;

a wafer transfer mechanism disposed to transfer the wafer between said first processing system and said second processing system;

means for illuminating the wafer while the wafer is transferred between said first processing system and said second processing system;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer, and where said spectral imager is configured to produce one-dimensional spectral frames; and

means for aggregating said one-dimensional spectral frames to form a two-dimensional spectral image and analyzing said two-dimensional spectral image to determine a film layer property of the one or more film layers.

132. (New) The system of claim 131 where the one or more film layer properties is a thickness value of one of the one or more film layers at one or more sites on the wafer.

133. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers between two wafer manufacturing processes, the method comprising the steps of:

using a transfer mechanism to secure the wafer from a first processing system that performs a first manufacturing step on the wafer;

illuminating the wafer with light from a light source;

positioning the wafer using said transfer mechanism so that a desired portion of the wafer is illuminated by light from said light source;

detecting light reflected from said desired portion of the wafer using a spectral imager configured to produce a sequence of contiguous one-dimensional spectral frames while said transfer mechanism moves the wafer;

aggregating said sequence of contiguous one-dimensional spectral frames to form a two-dimensional spectral image;

analyzing said two-dimensional image to determine one or more film layer properties of the one or more film layers; and

transferring the wafer to a second processing system that performs a second manufacturing step on the wafer.

134. (New) The method of claim 133 where the one or more film layer properties is a thickness value of one of the one or more film layers at one or more sites on the wafer.

135. (New) A CVD system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a CVD process, the system comprising:

a viewport for providing optical access to said CVD system;

means for illuminating the wafer through said viewport;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and passes through said viewport, where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion; and

means for aggregating said sequence of contiguous one-dimensional spectral frames to form a two-dimensional spectral image, and to analyze said two-dimensional spectral image to determine one or more film properties of the one or more film layers.

136. (New) The system of claim 135 where the one or more film layer properties is a thickness value of one of the one or more film layers at one or more sites on the wafer.

137. (New) The system of claim 135 where said aggregating means determines a process endpoint.

138. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a CVD process, the method comprising the steps of:

illuminating the wafer through a viewport with light from a light source;

positioning the wafer so that a desired portion of the wafer is illuminated with light that has passed through said viewport;

detecting light from said light source that is reflected from said desired portion of the wafer and passes through said viewport using a spectral imager configured to produce a sequence of spatially contiguous one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion;

aggregating said frames to form a two-dimensional spectral image; and

analyzing said two-dimensional spectral images to determine one or more film properties of the one or more film layers.

139. (New) The method of claim 138 where analyzing said two-dimensional spectral image determines a film layer thickness value of one of the one or more films at one or more sites on the wafer.

140. (New) The method of claim 138 where analyzing said two-dimensional spectral image determines a process endpoint.

141. (New) A semiconductor wafer processing system that acquires and analyzes spectral images of a wafer having one or more film layers prior to, during, and/or following a process, the system comprising:

a viewport for providing optical access to said system;

means for illuminating the wafer through said viewport;

a spectral imager disposed to detect light from said illuminating means that is reflected from the wafer and passes through said viewport, where said spectral imager is configured to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion; and

means for aggregating said sequence of one-dimensional spectral frames to form a two-dimensional spectral image and to analyze said two-dimensional image to determine one or more properties of the one or more film layers.

142. (New) The system of claim 141 where the one or more film layer properties is a thickness value of one of the one or more film layers at one or more sites on the wafer.

143. (New) The system of claim 141 where said aggregating means determines a process endpoint.

144. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers prior to, during, and/or following a wafer manufacturing process, the method comprising the steps of:

illuminating the wafer through a viewport with light from a light source;

positioning the wafer so that a desired portion of the wafer is illuminated with light that has passed through said viewport;

detecting light from said light source that is reflected from said desired portion of the wafer and passes through said viewport using a spectral imager configured to produce a sequence of

spatially contiguous one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion;

aggregating said frames to form a two-dimensional spectral image; and

analyzing said two-dimensional image to determine one or more properties of the one or more film layers.

145. (New) The method of claim 144 where analyzing said two-dimensional spectral image determines a film layer thickness value of one of the one or more films at one or more sites on the wafer.

146. (New) The method of claim 144 where analyzing said two-dimensional spectral image determines a process endpoint.

147. (New) A system for obtaining and analyzing spectral images of a wafer having one or more film layers, the system comprising:

means for transferring the wafer;

means for illuminating the wafer; and

a spectral imager disposed to detect light reflected from the wafer, where said spectral imager includes a camera whose components are designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to produce a plurality of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion; and

means for aggregating said plurality of one-dimensional spectral frames to form a two-dimensional spectral image and for analyzing said two-dimensional spectral image to determine one or more film layer properties of the one or more film layers.

148. (New) The system of claim 147 where the one or more film layer properties is a thickness value of one of the one or more film layers at one or more sites on the wafer.

149. (New) The system of claim 147 where said aggregating means determines a process endpoint.

150. (New) A method of obtaining and analyzing a spectral image of a wafer having one or more film layers, the method comprising the steps of:

illuminating the wafer with light;

positioning the wafer so that a desired portion of the wafer is illuminated; and

detecting light reflected from said desired portion of the wafer using a spectral imager that includes a camera whose components were designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to produce a sequence of one-dimensional spectral frames while said spectral imager and the wafer undergo relative motion;

aggregating with a processor said frames to form two-dimensional spectral images of all or a portion of the wafer; and

analyzing said two-dimensional images to determine one or more film properties of the one or more film layers.

151. (New) The method of claim 150 where analyzing said two-dimensional spectral image determines a film layer thickness value of one of the one or more films at one or more sites on the wafer.

152. (New) The method of claim 150 where analyzing said two-dimensional spectral image determines a process endpoint.

153. (New) A spectral imaging system for generating and analyzing spectral images of a portion of a wafer having one or more film layers, the system including:

a first lens assembly for collecting light reflected from said portion of the wafer;

a slit that receives light focused by said first lens assembly and forms a one-dimensional line image from within said portion of the wafer, where said slit restricts the light collected by said first lens assembly to said one-dimensional line image;

a second lens assembly to direct said one-dimensional line image;

a diffractive element to receive light focused by said second lens assembly and to disperse light of said one-dimensional line image in a spectral direction perpendicular to said one-dimensional line image;

a camera with components were designed primarily and predominately for time delay and integration and other non-spectrally-resolved line-scan applications and configured to operate in area scan mode to detect said dispersed light to form one-spatial dimension, one-spectral dimension frames of reflectance data; and

a processor for aggregating said frames to form two-dimensional spectral images of said portion of the wafer, and to analyze said two-dimensional spectral images to determine one or more properties of the one or more film layers.

154. (New) The system of claim 153 where the one or more film layer properties is a thickness value of one of the one or more film layers at one or more sites on the wafer.

155. (New) The system of claim 153 where said processor determines a process endpoint.